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>RMG ENTERPRISES PRESENTS<

S O U N D E S I G N

from ARROW SOFTWARE

written by

James Edwards

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PSG FUNDAMENTALS

This program will allow you to explore the Programmable Sound Generator!!!

The PSG (Programmable Sound Generator) consist of 14 sound registers. Registers Ø-5 control the tones for channels A,B,and C. Channel A uses registers Ø(FINE TUNE),1(COARSE TUNE). Channel B uses registers 2(FINE TUNE),3(COARSE TUNE). Channel C uses registers 4(FINE TUNE),5(COARSE TUNE). Register 6 is used to control the audio frequency for the Noise Generator. Register 7 controls which tone and/or noise source is being sent to the output channels. Registers 8-1Ø control Amplitude (VOLUME) for Channels A,B,and C. They also are used to activate Registers 11-13. Registers 11-13 are used to control the Envelope Generator.

USING THE REGISTERS

Registers Ø-5: Each channel (A,B,and C) has two registers which you can use. One register is for FINE TUNE and the second is for COARSE TUNE. The values for FINE TUNE is Ø-255, and the value for COARSE TUNE is Ø-15. You can use one or both to obtain the sound you want.

Register 6: This register produces a static noise type sound in which you can control the pitch of the noise. The values for the pitch are Ø-31.

Register 7: This register is called the ENABLE REGISTER, it tells the computer to play a tone or noise (or both). You can play just one channel or all of the channels. Each channel (A,B,and C) has a value which, must be subtracted from register 7 (the value of which starts at 63). Channel A=1, Channel B=2, Channel C=4. Example: To activate channel A, you must subtract 1 from register 7s' usual 63, which would = 62. To activate channel C, you would subtract 4 from 63. However, if you had already activated channel A, and you also wanted channel C activated, then you would subtract 4 from 62. So whatever value register 7 is currently holding (depending on what channel is currently activated), you always subtract from that value as you want to activate more channels. Any channel can be enabled for noise instead of tone. The values used to activate the channels for noise is as follows: Channel A=8, Channel B=16, Channel C=32. These values are subtracted from register 7 as mentioned above. You can mix tone with noise using the three channels. NOTE: Both tone and noise can be controlled by the Envelope Generator.

Registers 8-10: These registers control the the Amplitude (VOLUME) of the three channels. They are also used to enable the envelope generator. The VOLUNE range is 0-15. To enable the envelope generator then use value 16.

Registers 11-13: Registers 11 and 12 are used to control the period of the envelope generator control (how long it takes the VOLUME to build or fade). Register 11 is for the FINE TUNE (0-255), while 12 is for the COARSE TUNE (0-255). You can use one or both registers together. Register 13 determines the SHAPE of the envelope. The values used for register 13 are 0-15. The envelope SHAPE consist of 4 parameters. They are BUILD or FADE=4, HOLD=1, ALTERNATE=2, and CONTINUE=8: By adding these numbers together and then using that value for register 13 will create the SHAPE of the sound. NOTE: Page 193 of your TS 2068 Users Manual will give you a good understanding of the shapes created by register 13.

USING SOUNDESIGN

This program will let you explore the PROGRAMMABLE SOUND GENERATOR!!! There are 3 program menus. Menus 2 and 3 have pre-recorded sound effects and are self explanatory. Menu 1 is the heart of SOUNDESIGN. All three menus have printer options and will all display the information used to create the sound.

LK DOS → RND USR100 "LOAD "SOUND.BI"

Now let's get started: LOAD "SOUND" or LOAD "". The first thing you will see is Menu #1. You will notice that there are 16 items on this menu. The first 14 items are Registers Ø-13 and the last two are for changing menus, display and Printer option. You will see an arrow with a red bar over the first item on the menu which is your select mode indicater. You move the red bar down the menu using '0' key, and up the menu with the '1' key. NOTE: All key controls have a wrap around feature. You are now in Mode #1. By pressing the 'ENTER' key the arrow will then start flashing, this is Mode #2. In Mode #2 you can change the values of the register which is indicated by the red bar. To change this value you use the '1' key to increase the value one step at a time and use the '2' key to raise the value five steps at a time. Using the '0' key will lower the value one step at a time and using the 'W' key will lower the value five steps at a time. To reset the value use the 'Ø' key.

Now, press the 'ENTER' key. You should now be in Mode #2. Go ahead and use keys 1,2,0,W,and Ø. OK!! Now set this value to 211. Press 'ENTER' to go in to Mode #1. Move your Select Mode Indicater to register 7 (ENABLE register). Press 'ENTER' for Mode #2 (the arrow should be flashing). If you remember the section on PSG FUNDAMENTALS, to Enable register Ø (Channel A), you must subtract 1 from register 7 (63-1=62). Now, change the value of register 7 to the value of 62. Press 'ENTER' for Mode #1. Move your select indicater to register 8 (VOLUME for Channel A) and then press 'ENTER' for Mode #2. Now change the value from Ø to 15, and you will notice how, instantly, you hear the change. Leave the value at 15 and press 'ENTER' for Mode #1. Go back to register Ø, press 'ENTER' for Mode #2 and use your 1,2,0, and W keys to instantly hear the changes in tone.

HOW TO CREATE ADVANCED SOUND EFFECTS

All sound effects must have a BASE to start with. Let's take the sound of an airplane taking off. First, we need to create a BASE which I have already done: (3,15;6,16;7,40;9,15). The first number is the register and the second is the value separated by a comma. The registers are separated by a semi-colon. Now enter the following into Menu #1. 3,15;6,16;7,40; 9,15. Now, select Mode #1, go to register 3 and switch to mode #2. Change the value from 15 to 6 and back again to hear the sound of the airplane speeding up and slowing down. OK! Now, leave that value at 6 and go to Mode #1 and select register 9. Go to Mode #2, change the VOLUME from 15 to Ø to create the sound of the airplane getting farther away. NOTE: Registers 3 and 9 need to be changing to create the effect. We need to use varablies for these two registers and use a FOR/NEXT loop. This is how the program should look (minus line numbers):

```
LET b=15:FOR a=15 to 6 STEP -1: SOUND 3,a;6,16;7,40;9,b:PAUSE
3Ø:NEXT a:PAUSE 6Ø:FOR b=15 to Ø STEP -.1:SOUND 3,a;6,16; 7,4Ø
;9,b: Pause 1Ø: NEXT b
```

You will notice that the base was used twice to create this effect. Reset your computer and enter the above program to see how it works!

I think that you will find this utility to be a very useful tool once you learn how to create a base and build upon it.

FOR MORE FINE T/S AND QL PRODUCTS

CONTACT

RMG ENTERPRISES
1419 1/2 7TH STREET
OREGON CITY, OR 97Ø45
5Ø3/655-7484